Speeding Apple Peeling

Lye peeling is faster than hand peeling, and chemical aids have speeded lye peeling. Dewaxed apples can be lye peeled. Recent USDA research puts these 'parts' together to prove the savings in lye peeling dewaxed apples.

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Apple peeling by the mechanical knife method, used by most apple processors, involves much hand labor and results in a peeling loss of more than 15 percent. The peeling losses and labor costs increase as the size of the apples decreases; apples below 2¼" diameter cannot be knife-peeled economically, according to a study by Johnson, Lopez and Wood.

Lye peeling is used extensively for processing vegetables and for some fruits. Apples, however, are difficult to lye-peel because of the waxy, lye-repellent surface. The additional time required for lye peeling increases the heat damage to the product.

In previous reports, we described a procedure for dewaxing apples prior to lye peeling. This greatly reduces the time required for lye peeling and reduced the heat damage to the product.

A recent report by Schultz and Smith showed that lye peeling may be speeded up by incorporating a lye peeling aid in the lye bath.

The present study combined previous work to show that the combination of dewaxing and lye peeling aids gives a further reduction in the time required for lye peeling apples.

Laboratory Peeling Tests

Laboratory scale tests were made to compare the effectiveness of lye peeling before and after dewaxing apples, with and without the addition of a peeling aid (*Naccanol* or *Faspeel*) to the lye bath. Apples were dewaxed by 30-second exposure to the vapors of boiling isopropyl alcohol (178°F). The fruit was then immersed in a 10 percent lye bath maintained at 140°F. When a peeling aid, or detergent, was used, it was added at a concentration of 0.5 percent.

The peeling time was determined as the minimum time required to soften the peel sufficiently to be easily removed. The manner of peel removal was standardized. In this test, the soft peel was rubbed off by hand, under flowing cold tap water, using rubber gloves. The lye-peeled fruit was dipped in a 5 percent citric acid solution to neutralize any traces of lye and to prevent browning.

The results, shown in the table, indicate that the time required for lye peeling apples may be reduced from 10 minutes to 7 or 8 minutes by the use of *Faspeel* or *Naccanol*. However, dewaxing prior to peeling gave a much greater reduction in peeling time. The combination of dewaxing prior to peeling and the addition of a peeling aid to the lye solution reduced the peeling time to only 2 minutes.

The Effect of Dewaxing and Detergents on Time Required to Lye Peel Apples (in minutes)

Peeling Solution	Before Dewaxing	After Dewaxing
10% Lye	10	3
10% Lye + 0.5% Naccanol*	8	2
10% Lye + 0.5% Faspeel**	7	2

* A product of Allied Chemical Corporation, National Aniline Division, 40 Rector Street, New York, N. Y. 10006

** A product of Wyandotte Chemicals, Wyandotte, Mich. 48192

Note: Selection of commercial products and mention of a company or trade name does not imply endorsement by the Department of Agriculture over others not named.

Yield of Peeled Apples

The yield of peeled apples was determined by weighing the fruit before and after peeling. In general, the peel losses were between 5 and 10 percent. This is approximately one-half of the peel loss observed when the fruit is peeled by mechanical knife.

The peel loss discussed here is for the peel only, and does not include what would be lost in coring. The removal of cores by the usual method involves an additional weight loss of 15 to 25 percent, depending on the size of the fruit. With some products, such as sauce, it may not be necessary to remove the cores since seeds and carpel tissue would be removed by the finisher.

Lye peeling of apples offers the advantages of reduced labor cost and increased product yield. Also, by making it economical to use apples smaller than 2¼" diameter, it would be possible to reduce the cost of raw materials.

References

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